

Lesson Plan	
Subject/Course MCR 3U	TC Name
Grade Level: 11	Date:
Topic: The Sine Law	Time of Class 70 min.
AT Name.	Location
1. Curriculum Expectation(s) and Learning Goal(s) for the Lesson	
a) Expectations: <i>(List 1-3 specific expectations from the Ontario Curriculum. Be realistic about how much you can accomplish in one lesson.)</i>	
1.6 pose problems involving right triangles and oblique triangles in two dimensional settings, and solve these and other such problems using the primary trigonometric ratios, the cosine law, and the sine law (including the ambiguous case)	
b) Learning Goal(s): <i>(In your own words, what do you want the students to have learned by the end of the lesson? How will you know what they have learned the information?)</i>	
Students will: <ul style="list-style-type: none"> - Apply the sine law to problems in two dimensional settings - Solve problems using the sine law - Explore the ambiguous case of the sine law through a hands on activity 	
c) Success Criteria: <i>(The "I can" statements that specifically outline what the students need to do in order to achieve the learning goal)</i>	
Students can: <ul style="list-style-type: none"> - Draw and appropriately label models of real-world problems - Set up proportions and equations using the sine law - Solve proportions and interpret what their solutions tell them regarding the problem - Describe situations that produce multiple triangles and ambiguous results - Describe the relationship between the length of the sides of a triangle and the length of the height. 	
2. Pre-assessment and Accommodations / Modifications <i>(What knowledge do you need and what can you do to ensure the success of all students? Include IEP considerations when applicable) Use initials of students rather than full names.</i>	
Pre-assessment: <i>(Describe the students)</i>	Accommodation/ Modification: <i>(How will you adapt your lesson)</i>
Academic Needs: <i>(e.g. student finishes early or doesn't finish, student has difficulty understanding the concepts)</i>	.

Behavioural/Social/Emotional Needs: (e.g. student distracts others, up and out of his/her seat, verbal outbursts, student does not participate)		
Physical Needs: (e.g. student has vision, hearing or mobility impairments, allergies and/or other health needs)		
Diversity Needs: (e.g. cultural accommodations, ESL)		
3. Learning Environment (Describe the set up of the classroom (narrative or map), safety considerations, individual and/ or group work considerations, facilitating smooth and safe transitions)		
4. Overview of the Lesson (Write the information that you will provide to the students as the intro to the lesson). This is the student agenda.		
<ul style="list-style-type: none"> - Introduction to new lesson – state the goal of the lesson - Lesson – the sine law - Hands-on activity to explore the ambiguous case - Consolidation and explanation of homework - Work period - “Ticket Out the Door” question 		
5. Resources: List all the resources that you used to prepare the lesson along with all the materials that you require for the class. Be specific about what you will need during the class with numbers of the items.		
<ul style="list-style-type: none"> - Students’ textbook Nelson Functions 11 (pg. 312 - 320) - Nelson Functions 11 Teacher’s Resource (pg. 213 - 216) - Handout: Section 5.6 – The Sine Law - Handout: Section 5.6– Triangle Activity sheet - Ticket Out the Door Question - Homework quiz Section 5.6 - Netbooks (one per pair) 		
6. Content and Teaching Strategies for Lesson (This section should provide sufficient detail that another teacher could step in and teach the lesson using this outline)		
6.a. Introduction: Hook, Minds-On (how you will motivate students, get their attention)		
Timing	Content (what you will say, questions you will ask) Include references if appropriate.	Process (instructional/assessment strategies, individual and group work)

5	<p>Tell the students that today^[EU1]</p> <ul style="list-style-type: none"> - The goal is to solve two-dimensional problems by using the sine law - GeoGebra activity: Law of Sines^[EU2] 	Introduction and Hook
<p>6.b. Instruction/Application: Instruction: Organization and delivery of the content using effective instructional strategies and processes. This section is similar to a script and includes your statements, actions, student actions, transitions, students' activities, distribution of materials, guiding questions and anticipated student responses. Application: Connecting the lesson to real life and relevancy. This section explains how the students will apply the new learning. This typically follows instruction but could also be incorporated as part of the instruction. Examples include role playing, making a model, doing a task, creating a mind map</p>		
Timing	<p>Content</p> <p>Diagrams, facts, maps and information as applicable (include references)</p> <p>What you will say and questions you will ask.</p>	<p>Process-</p> <p>Instructional/assessment strategies, individual and group work.</p>
20	<p>Distribute the first page of the handout^[EU3].</p> <p>Lesson</p> <ul style="list-style-type: none"> - Remind the students of : <ul style="list-style-type: none"> • The Sine Law $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ • We can use the sine law if we know i) two angles and any side (AAS or ASA), ii) two sides and one angle opposite a given side (SSA) - Work through the example (see attached notes^[EU4]) 	<p>Instruction</p> <p>Activate prior knowledge</p>
20	<ul style="list-style-type: none"> - Explain to the students that they will be working on an activity to learn more about the sine law when there is a SSA situation. <ul style="list-style-type: none"> • Divide the class into pairs • Distribute the Triangle Activity sheets • Have students work on the activity in pairs: Law of Sines: Ambiguous Case^[EU5] • Discuss the results 	<p>Activity in groups</p>
<p>6.c Consolidation: Refer back to the learning goals and success criteria, how will you know they have learned? It wraps up the lesson, allows for feedback , reviews key concepts and summarizes learning.</p>		

Content ((diagrams, facts, information) what you will say, questions you will ask)		Process - Instructional strategies, individual and group work. What will the student do?
20	<p>Distribute the 2nd page of the handout^[EU6].</p> <p>Summarize what the students have discovered through the activity:</p> <ul style="list-style-type: none"> - In the SSA situation, multiple cases can occur (see handout) - If $\angle A$ is acute and <ul style="list-style-type: none"> • $a = h$, one right triangle exists • $a > h$, one triangle exists • $a < h$, no triangles exist • $h < a < b$, two triangles exist - If $\angle A$ is obtuse and <ul style="list-style-type: none"> • $a > b$, one triangle exists • $a < b$ or $a = b$, no triangles exist - <p>Students can begin their homework^[EU7]</p>	<p>Consolidation</p> <p>Individual seat work</p> <p>Assessment for learning</p>
5	<p>“Ticket out the door” question^[EU8]</p>	
6.d. Assessment: What assessment strategies do you need to have to ensure you are accountable for the students’ learning and addressing the expectations? What formative and summative assessments should you include? How will you know that they have met the learning goals?		
Content (Attach student activities, sample questions, observations, homework, rubrics, evaluation schemes as applicable). Include references and specific resources		Process- Identify strategy as assessment for learning, as learning and/or of learning. Identify strategy as formative or summative.
<ul style="list-style-type: none"> - Ticket out the door question - Homework quiz (done next day after homework review) 		<p>Assessment for learning</p> <p>Assessment of learning</p>

Potential challenges:

1) Time restrictions

The lesson is full of activities and setting up technology which can be time consuming

2) Technology

- In case the school does not have a class set of laptops (or netbooks), an alternative method of doing the activity would be required. The activity can be done using paper and rulers or as a whole class on the SmartBoard.

Discussion Questions:

1. How could we include “real life” applications?
2. How could we incorporate student discussion? Or student/peer evaluation?
3. Are these handouts beneficial to the students in your opinion?
4. Would you have the first geo sketch pad activity done on the smart board and run by the teacher? Or should students interact with it?